

**A Fluke Company**

# **E-DWT-H™**

## **Electronic Deadweight Tester**

Hydraulic Deadweight Tester Performance with  
Digital Measurement Convenience

# E-DWT-H Electronic Deadweight Tester— Leave the Deadweight Behind

## E-DWT-H in lab environment



### AutoTest™ lets E-DWT operators quickly define test points and adjust all of the range-dependent settings with a single function.

The resolution and stability test used by the RPM4-E-DWT are set according to the range of the device under test. The upper limit setting is also set and provides range-based warnings and overpressure protection. While running AutoTests, the operator is prompted to set each sequential test point and test data is stored in the RPM4-E-DWT for recall or download. Typical test setup is quick and easy, but more complex tests can also be stored and reused.

### Broad workload coverage

The E-DWT-H has the operational versatility to calibrate and test a broad range of pressure measuring instruments including:

- Analog gauges
- Transducers
- Calibrators
- Sensors
- Transmitters

### A modern alternative to the traditional deadweight tester

E-DWT-H breaks new ground, improving the hydraulic pressure calibration process. E-DWT-H is an electronic calibrator designed to replace mechanical, piston-cylinder and weight based deadweight testers. It's a lighter weight, easier-to-use deadweight tester alternative that is at home in the lab or instrument shop, as well as in the field performing in-situ calibrations and tests.

is complete hydraulic pressure calibration system combines the convenience and precision of continuous, real time electronic pressure measurement with the simple and direct operation of high quality operator controlled pressure generation hardware.

E-DWT-H one year measurement uncertainty is  $\pm 0.02\%$  of reading with ranges up to 30,000 psi. It can be configured to provide this uncertainty from its full scale down to 1% of its range. Built-in pressure generation and control hardware allow the operator to fill and prime the system under test and generate and precisely adjust pressure throughout the range with ease.

### Deadweight tester performance with digital measurement convenience

E-DWT-H offers precision, low measurement uncertainty and the stability over time of a conventional deadweight tester without the inconveniences associated with the piston-cylinders, weights, hand pumps, and interconnecting plumbing.

- No weights to load and unload or regularly send out for calibration
- No need to know and correct for local gravity or ambient temperature
- No piston-cylinder changes switch Q-RPT ranges in seconds
- Not sensitive to level or vibration
- Able to set and read any pressure value exactly, no minimum increment limited by smallest available masses
- Operates in any unit of measure while deadweight tester is typically limited to the pressure unit stamped on the mass
- Perfect for applications that require setting a nominal pressure precisely on the device under test and measuring it, such as analog gauge calibration
- On-board, AutoTest calibration routines and data acquisition
- Interfaceable with a PC or laptop to allow for automated data acquisition
- Two year calibration interval supported at measurement uncertainty of  $\pm 0.025\%$  of reading.
- Easily recalibrated without cross coating Automated calibration of E-DWT-H is possible using COMPASS® for Pressure software

### Versatility to cover a broad workload in a variety of environments

E-DWT-H is at home in metrology and calibration labs, on the production floor or in the field.

It operates with Sebacate calibration fluid, mineral oil, Skydrol® and other liquids.

An optional battery/charger pack supports up to eight hours of operation away from line power.

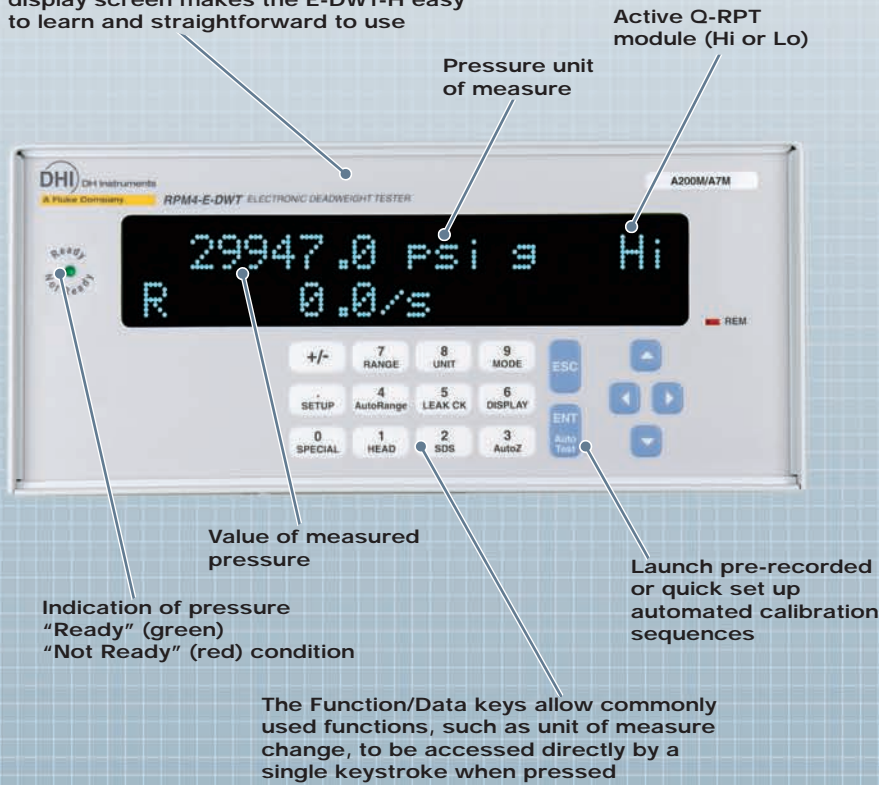


# E-DWT-H . . . high pressure hydraulic calibration made simple

E-DWT-H combines reliable, digital reference pressure measurement with high quality, easy-to-use pressure generation and control hardware.

## RPM4 reference pressure monitor front panel display

A clean, simple front panel with a large display screen makes the E-DWT-H easy to learn and straightforward to use



## E-DWT-H with single Q-RPT



Test port for single device under test or connection to test system/manifold (2nd test port on rear)

Calibration fluid reservoir

Fill, purge and prime the test system

RPM4-E-DWT reference pressure monitor with user interface



VARIABLE VOLUME

RESERVOIR

LO RPT ACTIVE

LO RPT ACTIVE

LO P

SET VAL

HI RPT

LO RPT SHUT OFF

TEST SHUT OFF FINE ADJ

Warning light and audible alarm when Lo Q-RPT isolation valve is not in correct position

In E-DWTs with dual Q-RPTs, half turn, spring loaded valve isolates the low pressure Q-RPT when the high pressure Q-RPT is in use

Shuts off test ports to refill variable volume if needed and provides superfine pressure adjustment

Indicator lights with audible alert to instruct user of correct position of Lo Q-RPT isolation valve



# Automation and support

## Integration made easy

### COMPASS® for Pressure



### E-DWT-H in the field

E-DWT-H has been designed for ease of use in the field performing in-situ calibrations and tests. The optional rugged, wheeled case allows quick setup and makes transport easy and worry free. With the battery pack option, eight hours of field application is possible. No need to drain fluid or disassemble hardware for transport. Simply remove from case connect to test item.



### Automate data collection and manage calibration assets with COMPASS® for Pressure software

E-DWT can run stand-alone tests and collect test data. Test data can be downloaded over the RPM4-E-DWT's RS232 interface.

The RPM4-E-DWT's RS232 interface can also be used to run the E-DWT with COMPASS® for Pressure software or user developed software.

COMPASS® for Pressure software is universal pressure calibration software for the laboratory, which can be used to run simple or complex tests with multiple instruments. The user can create his/her own calibration report, and data can be exported to Fluke MET/CAL® Plus Calibration Management Software.

### The support you need, when you need it

DHI's calibration, testing and repair services are dedicated to satisfying your needs quickly and at a fair cost while maintaining the unmatched level of quality that is our trademark.

DHI's calibration laboratories are accredited by the American Association for Laboratory Accreditation (A2LA) for conformance to ISO Guide 17025.

As a Fluke company, DHI has access to global calibration and repair facilities to keep your hardware in top working order.

If you need training for yourself or your staff, DHI offers a broad range of classes including: the principles and practices of pressure calibration, advanced pressure metrology, gas flow calibration using a DHI molbloc/molbox system, set up and operation of COMPASS® for Pressure calibration assistance software, and much more.

Fluke's commitment to support provides additional benefits as well, including invitations to software user group meetings and conferences, periodic email bulletins and a pressure and flow newsletter.

# Summary specifications

## General

<b>Power requirements</b>	To RPM4-E-DWT: 12 V dc 1.2 A
	To AC to DC power supply: 100V ac to 240V ac, 50/60 Hz
<b>Temperature range</b>	Storage: - 20 °C to 70 °C
	Operating: 10 °C to 40 °C
<b>Relative Humidity</b>	Storage: 0 % to 100 %
	Operating: 0% to 70%
<b>Weight</b>	1 Q-RPT: 12 kg (26 lb) approximate
	2 Q-RPT: 14 kg (30 lb) approximate
<b>Dimensions</b>	E-DWT footprint: 41.4 cm W x 37.1 cm D (16.3 in x 14.6 in)
	E-DWT height: 26.9 cm (10.6 in), 33.6 cm (13.2 in) to max variable volume handle height
<b>Pressure ranges</b> Dependent on Q-RPT(s) included in RPM4-E-DWT.	200 MPa (30,000 psi) maximum with standard variable volume
	100 MPa (15,000 psi) maximum with high volume (-HV) variable volume
<b>Operating medium</b>	Delivered filled with oil (di-ethyl-hexyl sebacate) or dry
	<i>Standard E-DWT-H compatible with Sebacate, silicon oils, propylene glycol, fully fluorinated liquids, partially fluorinated liquids, isopropyl alcohol, and distilled water. Option for Skydrol or mineral oil preparation.</i>
<b>Reservoir capacity</b>	300 cc (18 in <sup>3</sup> )
<b>Variable volume displacement</b>	Standard: 3 cc (0.18 in <sup>3</sup> ), 200 MPa (30,000 psi) maximum
	High: 7 cc (0.43 in <sup>3</sup> ), 100 MPa (15,000 psi) maximum
<b>Filling and priming pump displacement</b>	3.7 cc (0.23 in <sup>3</sup> )
<b>TEST pressure connection</b>	DH500 female. Note: DH500 is a gland and collar type fitting for 6mm (1/4 in) coned and left hand threaded tubes equivalent to AE F250C, HIP HF4, 9/16-18 UNF, etc.
<b>Pressure Limits</b>	Maximum Working Pressure: Range of RPM4-E-DWT monitor's Hi Q-RPT 200 MPa (30,000 psi) with standard variable volume 100 MPa (15,000 psi) with high volume variable volume
	Maximum priming pump pressure: 700 kPa (100 psi)
	Maximum Working Pressure with Lo Q-RPT selected: Range of RPM4-E-DWT monitor's Lo Q-RPT
<b>Communication ports:</b>	RS232 (COM1, COM2)

## Pressure measurement

<b>Warm up time</b>	15 minute temperature stabilization recommended from cold power up
<b>Normal Operating Temperature Range</b>	10 °C to 40 °C
<b>Resolution</b>	Default: 0.01 % of active range
	User adjustable to 1 ppm of Q-RPT maximum or 10 ppm of active AutoRange, whichever is larger
<b>Precision<sup>1</sup></b>	± 0.018% of reading or 0.0018% of Q-RPT span, whichever is greater
<b>Predicted Stability<sup>2</sup></b>	One year: ± 0.0075% of reading
	Two year: ± 0.015 % of reading
<b>Measurement Uncertainty<sup>3</sup></b>	One year: ± 0.02% of reading or 0.002% of Q-RPT span, whichever is greater
	Two year: ± 0.025% of reading or 0.0025% of Q-RPT span, whichever is greater

1. Combined linearity, hysteresis, and repeatability. Precision does not include stability or calibration reference uncertainty.

2. Predicted Q-RPT measurement stability limit (k=2) assuming regular use of AutoZero function and short term stability between zeroing

3. Maximum deviation of the Q-RPT indication from the true value of applied pressure including precision, predicted stability with zeroing, temperature effect from 10 °C to 40 °C and calibration uncertainty (assumes calibration reference uncertainty of ±0.005% of reading, k=2), combined and expanded (k=2) following the ISO "Guide to the Expression of Uncertainty in Measurement."

